

THURSDAY, NOVEMBER 19, 1874

ELIE DE BEAUMONT

THE life of the science of geology has been short ; that of many of its illustrious votaries has been long. There still survive a few whose recollections go back to the early triumphs of the science in the days of William Smith and Cuvier. But their number grows rapidly less. One by one the links which bind us personally with the glories of the past are being snapped asunder. The grand old oaks under whose branches the younger saplings have grown up are fast dropping down. Within the last few years we have lost in this country our Murchison, Sedgwick, and Phillips ; Austria her Haidinger ; Germany her Gustav Rose, Bischof, and Naumann ; America her Agassiz, and France her D'Archiac and De Verneuil. To this list we have now to add the well-known name of L. Elie de Beaumont. To the expressions of regret with which the friends and pupils of that father in science have followed his remains to the tomb, geologists in every country will add their sympathy. Those who knew him best have eulogised his love of truth, his piety, and his generous feeling for younger and struggling men of science.

The name of Elie de Beaumont is chiefly known out of France by its association with two theories—*Cratères de soulèvement* and the *Réseau pentagonale*—which he espoused and vigorously defended, but neither of which has met with general acceptance, though no one can peruse the writings in which they are developed without admiring the wonderful industry of Elie de Beaumont in the accumulation of facts and the felicitous imagination with which he marshalled these facts in support of the theory to which he had pledged himself. It is not easy for geologists in other countries to understand the vast influence which for nearly half a century he has held in France. We must bear in mind the system of centralisation which controls even scientific enterprise in that country, and the fact that Elie de Beaumont held official posts in Paris which gave him a powerful sway over geological and mining matters, especially such as were under the guidance of the State. Hence it was not merely his great reputation, but his official position, which enabled him for so many years in great measure to control the progress of physical geology in his native country.

This eminent geologist was born in the year 1798. In 1817 he entered the Ecole Polytechnique, where he greatly distinguished himself, leaving it in the first rank for the Ecole des Mines. At that institution he showed a strong tendency towards geological pursuits, and such capacity for their prosecution that he was soon chosen to perform one of the most onerous tasks which had ever been undertaken by the Mining Department of France. The publication of Greenough's geological map of England, and the reception of a copy of it in the year 1822 at the Ecole des Mines, revived a project which political considerations had displaced, of constructing a geological map of France. When the decision to undertake this great work was formed, Elie de Beaumont, with his fellow-pupil and future friend and associate Dufrénoy, was selected to carry out the necessary surveys. With

the view of giving them still further training for their task, the authorities sent them over to study the geology of England, particularly the arrangement of the secondary rocks of this country, which by the genius of William Smith had become a type for all parts of Europe. Six months were spent in this preliminary work, some portion of the time being devoted to a careful study of British mines and mining, on which the two young engineers furnished some voluminous and skilful reports. It was the year 1825 before they received orders to begin their surveys. France was separated into two sections, the eastern half being allotted to Elie de Beaumont. The two observers, however, met frequently, and after the main part of their labours was concluded they went over portions of the ground together, so that in the end, agreeing on all main points, they produced a harmonious and magnificent work. In ten years they had completed their surveys. The engraving necessarily occupied some five years more, after which the indefatigable authors produced two large and exhaustive quarto volumes of explanations of the map, wherein the geological structure of their country was well described.

Of all the achievements of Elie de Beaumont, this, his first, is probably that on which his fame will ultimately most securely rest. It was a great work, most conscientiously and skilfully performed, amid difficulties which can only be adequately realised by those who have essayed geological mapping, and who know the nature of the ground over which the French explorer had to trace his lines.

During the twenty-three years (1825-48) which elapsed between the beginning and the completion of the map and its accompanying text, Elie de Beaumont had made his name widely known by other important contributions to science. A few years after the mapping had begun, and while engaged in exploring the high grounds in the east of France, he was struck by the relations which could be traced between the direction of different lines of mountain and the nature and position of the strata along these lines of elevation. In 1829 he published the first sketch of the theory which afterwards grew into the well-known *Réseau pentagonale*. He likewise adopted and defended Von Buch's *Erhebungs-krater* theory, publishing in its support an elaborate essay on the structure of Etna (1836). One of his best essays was published in 1847, "*Sur les Emanations Volcaniques et Métallifères*," a luminous exposition from the point of view of a cataclysmist of the history of the volcanic phenomena of the globe. One of his best separate publications is his "*Leçons de Géologie pratique*," a work full of knowledge and research, which may be usefully studied by all who take interest in dynamical geology. It would take some time to enumerate even the titles of his various contributions to the transactions and journals of his day. They include short notes and long memoirs of original research of his own, elaborate reports upon the writings of others (of this style he was a master), instructions to exploring expeditions, &c. ; and they are not confined to physical geology, but embrace also the allied sciences—chemistry, mineralogy, and palæontology. One feature which characterises them is the endeavour after exactitude. Their author had a mathematical mind, and sought for mathematical precision in his development of a subject.

Elie de Beaumont in the course of his long career filled many offices of distinction. As far back as 1827 we find him lecturing for his master at the Ecole des Mines, and afterwards succeeding to the chair. In 1832, on the death of Cuvier, he was chosen to fill the only chair of Natural History at the Collège de France. He thus stood at the head of the geological tuition of the country. The mining engineers and others who required geological instruction for State certificates or appointments passed through his hands. His fame likewise attracted many from a distance, so that as a teacher his influence must be regarded as having been very great. Moreover, he became Inspector-General of Mines, member and perpetual secretary of the Academy of Sciences, and was an associate of many of the learned societies of Europe and America. His scientific renown and high personal character led to his being chosen as senator and raised to the rank of Grand-Officier of the Legion of Honour. Full of honours, therefore, he has closed a long life with his faculties unimpaired to the last, and in the midst of the activity which had marked his long and honourable career.

This is perhaps hardly the place or the time to pass any judgment on the work of the illustrious man who has just gone from among us. His name will ever be associated with the history of geology, linked with those of Cuvier, Brongniart, Dufrenoy, and others who led the way to all that has since been achieved in the geology of France.

ARCH. GEIKIE

FLÜCKIGER AND HANBURY'S "PHARMACOGRAPHIA"

Pharmacographia: a History of the principal Drugs of Vegetable Origin met with in Great Britain and British India. By Friedrich A. Flückiger, Ph.D., Professor in the University of Strassburg; and Daniel Hanbury, F.R.S., Fellow of the Linnean and Chemical Societies of London. (Macmillan and Co., 1874.)

THERE was a stir of anticipation and inquiry amongst pharmacologists when it first became known that Prof. Flückiger and Mr. Hanbury were engaged upon a work of joint authorship. Speculation was busy as to what was to be the nature of the book, to what particular objects it would be directed, what extent of ground it would cover, and so forth. Upon a single point all were agreed, namely, that it would *not* be one of those composite treatises on drugs—organic and inorganic—therapeutics, pharmacy, and toxicology, enlivened by traditional botany and old-fashioned chemistry, which have passed current amongst us as "Manuals of Materia Medica."

One generation after another of compilers have produced volumes supposed to be suited to the wants of the time, in which the same sort of information has been given, the same errors perpetuated often in almost identical words, until the very term "Materia Medica" has come to be looked upon with suspicion by scientific men. Perhaps the origin of the shortcomings of the general run of such works may be traced to the fact that they have often been written by practising physicians who were lecturers in medical schools, and have been designed primarily as handbooks for medical students. Nor need

it be a matter of wonder that, with no special facilities for acquiring original information as to the history of drugs, and with few opportunities for verifying the statements of others, authors so situated were content to transcribe without examination what had been already recorded as fact, and to devote their better energies to the more purely medical relations of the subject—the aspect of chief interest both to themselves and those for whom they wrote.

The question has often been raised, and once at least on very high authority, why the overcharged curriculum of medical study should still be encumbered with *Materia Medica*; why, in view of the separation which is gradually taking place between the practice of Medicine and that of Pharmacy and of the scientific education now received by the pharmacist, such matters as the physical characters sources, and chemistry of drugs should not be referred to those whom they primarily affect.

This, perhaps, is scarcely the place to discuss such questions in detail, but they inevitably present themselves on a comparison of the present book with any of those to which allusion has just been made.

It is generally no very difficult thing to give an intelligible account of a work embodying the results of scientific research. It is not requisite that the knowledge of the reviewer should be co-extensive with that of the author to enable him to form a just estimate of its strong and weak points, or even to exercise the critical faculty where opinions rather than facts are advanced. But the task of introducing suitably a closely printed volume of 700 pages, containing scarcely anything but facts—an unusual proportion of which are stated for the first time, and those which are old assuming a new importance from their fresh verification, the whole given with a condensation of style that refuses page-room to a superfluous word—is not one that can be performed by the ordinary method of summarising results.

The scope of the "Pharmacographia" and the intention of its authors can hardly be better told than by a few extracts from the Preface. After defining the word Pharmacographia as "a writing about drugs," the authors state that "it was their desire not only to write upon the general subject and to utilise the thoughts of others, but that the book which they had decided to produce together should contain observations that no one else has written down. It is in fact a record of personal researches on the principal drugs derived from the vegetable kingdom, together with such results of an important character as have been obtained by the numerous workers on *Materia Medica* in Europe and America."

Restricting the field of their inquiry by the exclusion of Pharmacy and Therapeutics, "the authors have been enabled to discuss with fuller detail many points of interest which are embraced in the special studies of the pharmacist."

"The drugs included in the work are chiefly those which are commonly kept in store by pharmacists, or are known in the drug and spice market of London. The work likewise contains a comparatively small number which belong to the Pharmacopoeia of India: the appearance of this volume seemed to present a favourable opportunity for giving some more copious notice of the latter than has hitherto been attempted."

Now as to the manner of treatment. A uniform sub-